Montana Clinical Communication & Surveillance Report

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS

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TRENDS IN DIABETES IN PREGNANCY AMONG AMERICAN INDIAN AND WHITE MOTHERS IN MONTANA 1989-2003: AN UPDATE

WHAT'S INSIDE

BACKGROUND

This report updates the previous reports describing the trends in diabetes in pregnancy in Montana with data from the years 2001-2003 and provides more detail about gestational diabetes (GDM).[1,2] Focusing on GDM is very timely for several reasons. First, the benefit of screening and treating gestational diabetes was recently documented in a randomized clinical trial published in the New England Journal of Medicine.[3] The study showed that the rate of serious perinatal complications was significantly lower in an intervention group compared to a usual care group. Secondly, with the increases in obesity among young women in the US, there has been concern that GDM may also be increasing. Investigators in Denver documented a doubling of GDM prevalence in the Kaiser Permanente patient population between 1994 and 2002.[4] Finally, the risk of type 2 diabetes among women with a history of GDM is high particularly in the first five years post partum and clinical trials have shown that intensive lifestyle intervention can prevent the progression to diabetes in high-risk individuals.[5,6]

METHODS

Montana birth records for the years 1989 to 2003 were utilized for this study. Births to residents of Montana were included whether or not women actually delivered in state, but births to non-resident women who delivered in the state were excluded from these analyses. In addition, we excluded a small number of births among Montana residents whose race was not categorized as American Indian or white (approximately 2% of all births).

From 1989 through 1996, Montana birth certificates included a check box to indicate the presence of diabetes. Beginning in 1997, two check boxes were included in order to distinguish the presence of gestational diabetes (GDM) from pre-pregnancy diabetes. From 1997 through 1999, some birth certificates had both GDM and pre-pregnancy diabetes checked. Therefore, trends in the rates of GDM and pre-pregnancy diabetes in American Indian and white women were calculated only for births in 2000 and later.

Data analyses were conducted using SPSS software version 13.0 (Chicago, IL). Birth records were grouped in five three-year time periods to assess trends in the rate per 1,000 live births of any diabetes in pregnancy among American Indian and white Montana mothers. From 2000 to 2003, trends in the rates of GDM and pre-pregnancy diabetes in American Indian and white women were also estimated. Chi-square tests were used to identify statistically significant differences in the rates of any diabetes in pregnancy from two time periods: 1989-1991 and 2001-2003, and to identify statistically significant differences in the rates of GDM and pre-pregnancy diabetes in the most recent years since 2000.

RESULTS

From 1989 through 2003, there were 167,367 live births to Montana women. Overall, the total annual number of live births decreased slightly from the beginning of the decade (1989-1991) to the end of the decade (1998-2000) but increased slightly in the most recent time-period (2001-2003). Eighty-six percent of births were to mothers classified as white and 12% to mothers of American Indian descent. The mean age of Montana women with live births in 1989-1991 was 26.6 years (95% CI: 26.5-26.6) and increased to 27.3 years (95% CI: 27.3-27.4) in 2001-2003 ($P < 0.05$).

The total number of live births with any diabetes in pregnancy increased for American Indian and white mothers from the first time-period (1989-1991) to the most recent time-period (2001-2003). During each of the five time-periods, the rate of any diabetes in pregnancy was significantly higher (approximately 1.5 times) in American Indian mothers compared to white mothers (Table 1). During the past decade, in both American Indian and white mothers, the rate per 1,000 live births of any diabetes in pregnancy steadily increased. However, this rate began to level off during the last time-period (Figure 1). During the five time-periods, the rate of any diabetes in pregnancy increased significantly in both younger (<30 years) and older (≥30 years) white mothers and among younger American Indian mothers (Figure 2). However, the increase in the rate for older American Indian mothers did not reach statistical significance.

From 2000 to 2003, the proportion of diabetes in pregnancy identified as GDM increased among both American Indian mothers (from 71% to 78%) and white mothers (from 80% to

Table 1. Number of births and the number of births with any diabetes in pregnancy among American Indian and white Montana mothers, 1989-2003.

	Time Period				
	1989-1991	1992-1994	1995-1997	1998-2000	2001-2003
	n (%)	n (%)	n (%)	n (%)	n (%)
All live births	34,767 (100)	33,892 (100)	32,816 (100)	32,516 (100)	33,376 (100)
American Indian	4,200 (11)	3,803 (11)	3,638 (11)	3,772 (12)	4,149 (12)
White	30,176 (87)	29,656 (88)	28,705 (87)	28,243 (87)	28,630 (86)
With any Diabetes					
American Indian	132 (3.1)	136 (3.6)	122 (3.4)	155 (4.1)	176 (4.2)*
White	532 (1.8)	645 (2.2)	617 (2.1)	742 (2.6)	712 (2.5)*

** P ≤0.05 for comparison between 1989-1991 and 2001-2003.*

Figure 1. Rate per 1,000 live births of any diabetes in pregnancy among American Indian and white mothers, Montana, 1989-2003.

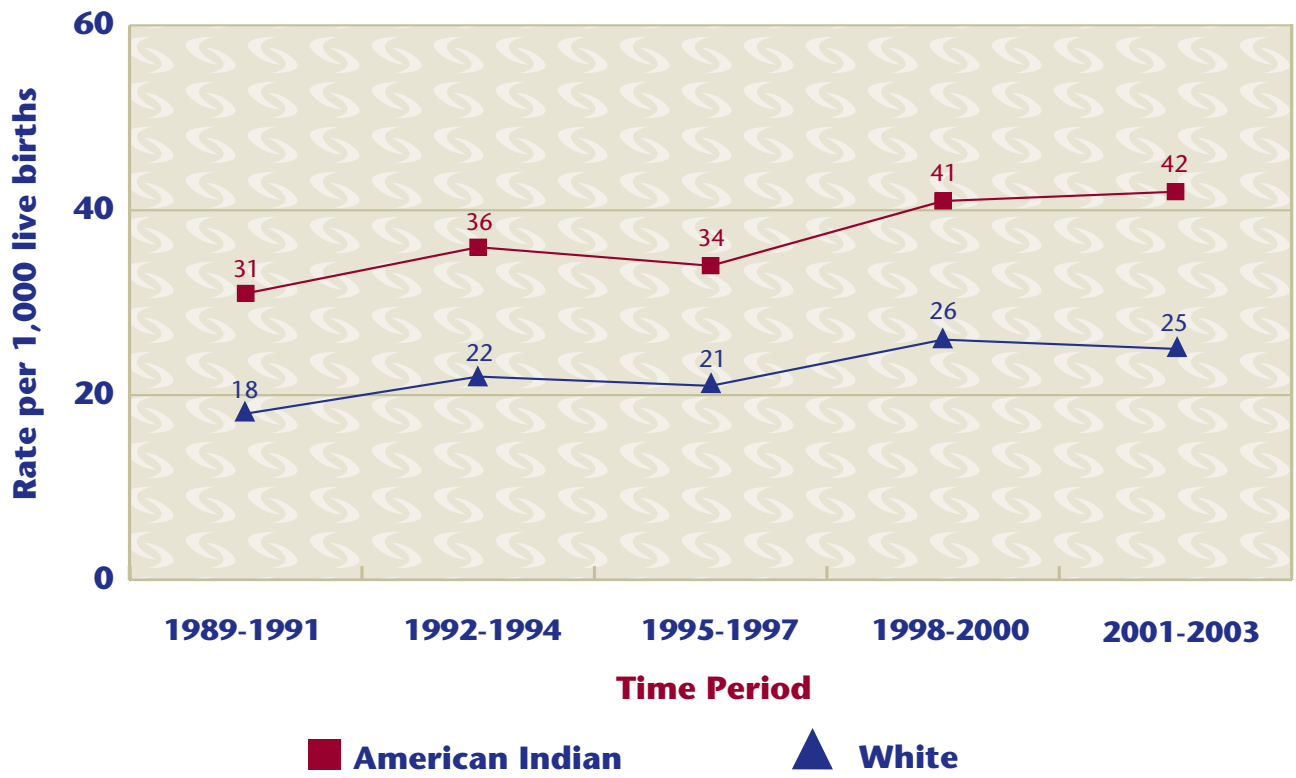
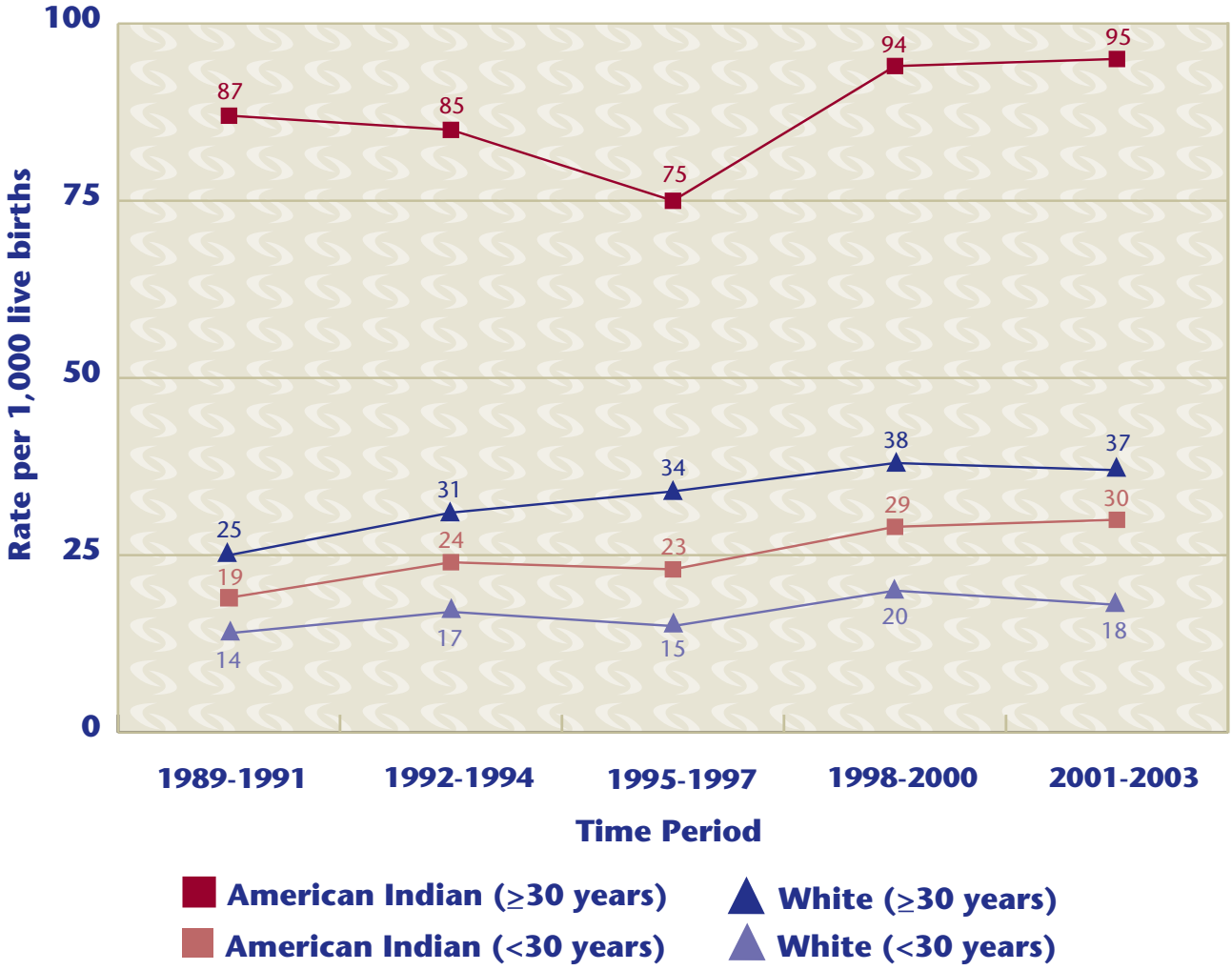


Figure 2. Rate per 1,000 live births of any diabetes in pregnancy among American Indian and white mothers, by age group, Montana, 1989-2003.



82%) (Table 2). The percentage of GDM was significantly higher in American Indian mothers compared to white mothers in 2001 (3.7% vs. 2.0%) and in 2002 (3.6% vs. 2.1%), but this difference did not reach statistical significance in 2000 (2.4% vs. 2.0%) or 2003 (2.9% vs. 2.2%) (Table 3). The percentage of pre-pregnancy diabetes was two-fold higher in American Indian mothers compared to white mothers (1.0% vs. 0.5%) in 2000. In 2003, the percentage of pre-pregnancy diabetes in American Indian mothers decreased slightly to 0.8% and remained constant for white mothers at 0.5%.

From 2000 to 2003, the rate per 1,000 live births of GDM increased slightly in younger American Indian (18 to 23), younger white (15 to 17) and in older American Indian (54 to 56) mothers and remained relatively constant for older white mothers (30 to 29) (Figure 3). In every year from 2000 to 2003, the rate of GDM was also significantly greater in both American Indian and white older mothers compared to younger mothers.

Table 2. Proportion of diabetes in pregnancy associated with GDM and pre-pregnancy diabetes among American Indian and white mothers, Montana, 2000-2003.

	2000	2001	2002	2003
	n (%)	n (%)	n (%)	n (%)
American Indian				
GDM	32 (71)	51 (80)	50 (82)	40 (78)
Pre-pregnancy diabetes	13 (29)	13 (20)	11 (18)	11 (22)
White				
GDM	191 (80)	188 (87)	200 (84)	211 (82)
Pre-pregnancy diabetes	48 (20)	29 (13)	39 (16)	45 (18)

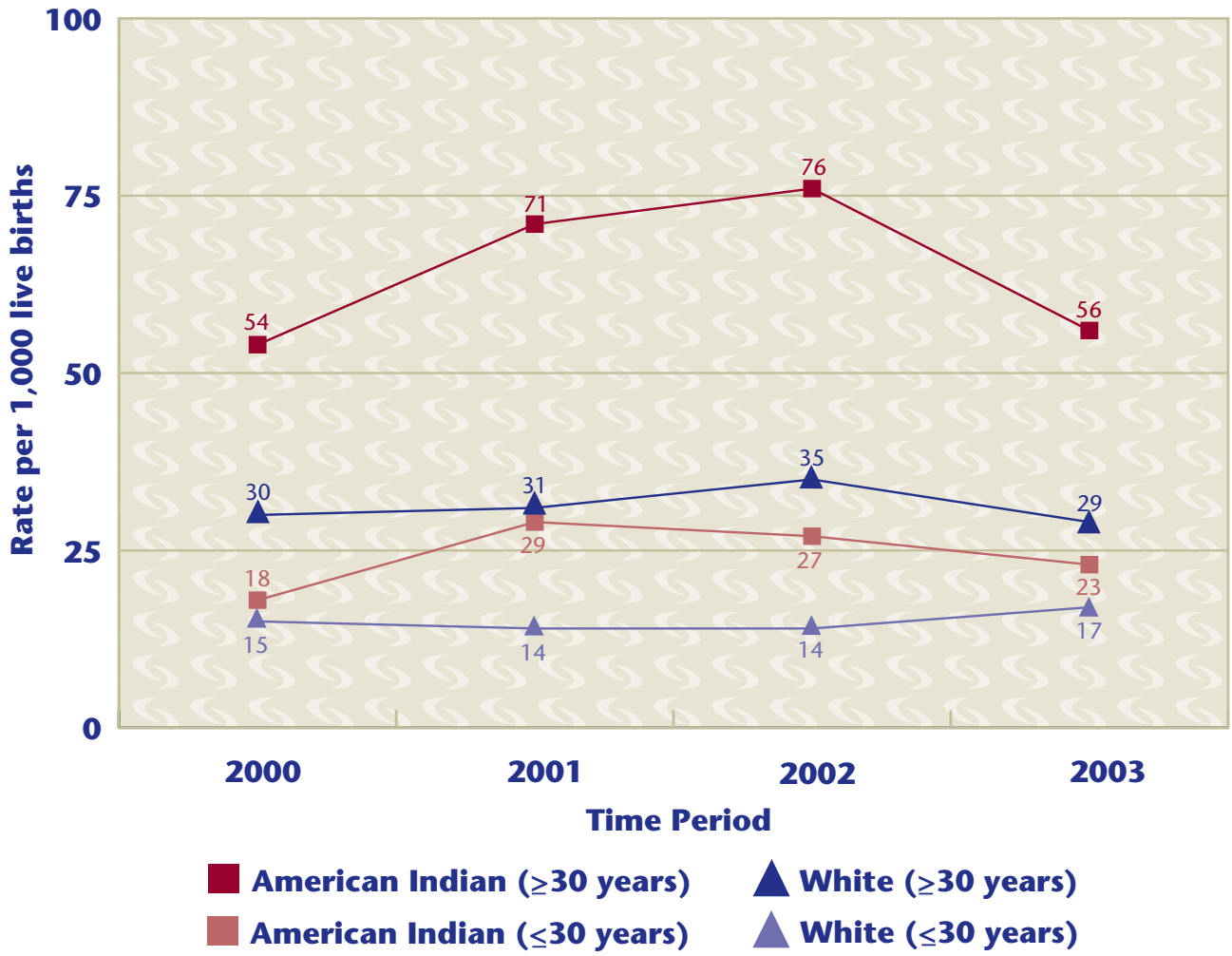
Table 3. Number of live births and number of births with GDM and pre-pregnancy diabetes among American Indian and white Montana mothers, 2000-2003.

	2000	2001	2002	2003
	n (%)	n (%)	n (%)	n (%)
All live births	10923 (100)	10947 (100)	11045 (100)	11384 (100)
American Indian	1326 (12)	1363 (12)	1393 (13)	1393 (12)
White	9438 (86)	9392 (86)	9467 (86)	9771 (86)
Diabetes in pregnancy				
GDM				
American Indian	32 (2.4)	51 (3.7)	50 (3.6)	40 (2.9)
White	191 (2.0)	188 (2.0)	200 (2.1)	211 (2.2)
Pre-pregnancy				
American Indian	13 (1.0)	13 (1.0)	11 (0.8)	11 (0.8)
White	48 (0.5)	29 (0.3)	39 (0.4)	45 (0.5)

DISCUSSION

During a 15-year time-period, Montana's birth records document a significant increase in the rate of any diabetes in pregnancy in both American Indian and white mothers. However, in the most recent years, rates of any diabetes in pregnancy appear to have stabilized among both American Indian and white mothers. From 2000 through 2003, there was a slight increase in the rate of GDM in American Indian and white mothers while the rate of pre-pregnancy diabetes decreased slightly in American Indian mothers and remained constant in white mothers. Recent Montana birth records also show that most of the diabetes in pregnancy is classified as "gestational" in both American Indian and white mothers. The increases in GDM rates in recent years may reflect increased screening for diabetes during pregnancy or there may have been an actual increase in the incidence of GDM. Nonetheless, the identification of GDM presents an important opportunity for intervention both during and after pregnancy. Not only can pregnancy outcomes be improved with treatment, but progression to diabetes post partum can also be prevented or at least significantly delayed.[5,6] It is clearly time to treat GDM, not only during pregnancy, but also after delivery.[6]

Figure 3. Rate per 1,000 live births of gestational diabetes among American Indian and white mothers, by age group, Montana, 2000-2003.



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SAVE THE DATE!

6TH ANNUAL WYOMING DIABETES CONFERENCE – SHERIDAN, WYOMING – SEPTEMBER 15-16, 2005

The Wyoming annual professional diabetes conference will take place September 15-16 at the Holiday Inn in beautiful Sheridan, Wyoming. Celebrity speaker Wilford Brimley will entertain guests during a dinner presentation Sept. 15 at the renowned Sheridan Inn, built by Buffalo Bill Cody. The conference theme is "Diabetes – Beyond the Basics" and will address issues related to diabetes such as NASH, obesity management, women's health, hospitalization care, professional teamwork, pharmacology, type 1, vision and dental health, foot care, celiac disease and naturopathic medicine. Dr. Phillip Hooper will present at a pre-conference dinner on September 14. CME/CE are available. Registration is a very affordable $95 and includes all meals. To register online visit https://outreach.uwyo.edu/eventmanager/OnlineRegistration.asp?EventCode=5C5.

2005 DIABETES PROFESSIONAL CONFERENCE – MISSOULA, MONTANA – OCTOBER 6-7, 2005

The Montana Diabetes Project's Annual Professional Conference will be held on Thursday and Friday, October 6-7, 2005 in Missoula, Montana at the DoubleTree Hotel. This year's conference will include sessions addressing Research Updates on Diabetes, Diabetic Retinopathy, and Exercise in the Management and Prevention of Diabetes. Dr. Guenther Boden will be the keynote speaker. Educational credits will again be offered. For more information call Susan Day at 406/444-6677 or e-mail sday@mt.gov.

2ND ANNUAL YELLOWSTONE VALLEY REGIONAL STROKE CONFERENCE MANSFIELD HEALTH EDUCATION CENTER – BILLINGS, MONTANA – OCTOBER 28, 2005

This conference will review new approaches to the diagnosis and treatment of stroke as well as recent medical advances in prevention and rehabilitation of stroke. For more information contact Northwest Research & Education Institute (NWREI) at 406/237-5303 or e-mail cme@nwrei.org.

WHAT ARE THE MONTANA DIABETES PREVENTION AND CARDIOVASCULAR HEALTH PROGRAMS AND HOW CAN WE BE CONTACTED?

The Montana Diabetes Control and Cardiovascular Health Programs are funded through cooperative agreements with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU822743-03), the Division of Adult and Community Health (U50/CCU821287-04) and through the Montana Department of Public Health and Human Services.

The mission of the Diabetes Control and Cardiovascular Health Programs is to reduce the burden of diabetes and cardiovascular disease among Montanans. Our web pages can be accessed at http://ahec.msu.montana.edu/diabetes/default.htm and http://montanacardiovascular.state.mt.us.

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